

Claims:

1. A throttle system for an internal combustion engine, comprising a throttle valve, accelerating means operated by an operator to adjust an engine output of the internal combustion engine, throttle valve controlling means for controlling the throttle valve to open in accordance with the manner in which the accelerating means has been operated, the throttle valve controlling means being adapted to execute under given conditions a throttle opening rate limitation limiting a throttle opening rate at which the throttle valve is opened, below a limit opening rate, the throttle system being characterized in that:

engine speed detecting means for detecting an engine speed of the internal combustion engine is provided; and

the throttle valve controlling means is further adapted to prohibit the throttle opening rate limitation if the engine speed detected via the engine speed detecting means at starting opening the throttle valve is above a prescribed engine speed.

2. A throttle system as set forth in claim 1, characterized in that:

engine torque detecting means for detecting an engine torque of the internal combustion engine is provided; and

the throttle valve controlling means is further adapted to prohibit the throttle opening rate limitation if the engine torque detected via the engine torque detecting means at starting opening the throttle valve is above a prescribed engine torque.

3. A throttle system as set forth in claim 1, characterized in that:

throttle opening amount detecting means for detecting an opening amount of the throttle valve is provided;

the throttle valve controlling means is further adapted to prohibit the throttle opening rate limitation if the opening amount of the throttle valve detected via the throttle opening amount detecting means at starting opening the throttle valve is above a prescribed opening amount.

4. A throttle system as set forth in any one of claims 1 to 3, characterized in that:
the throttle valve controlling means is further adapted to:
determine based on the manner in which the accelerating means has been operated
whether the throttle valve is required to open quickly, and
prohibit the throttle opening rate limitation if the throttle valve is not required to open
quickly.
5. A throttle system as set forth in any one of claims 1 to 3, characterized in that:
the throttle controller is further adapted to:
determine a target throttle-open amount by which the throttle valve is required to open
and a target throttle opening rate at which the throttle valve is required to open based on
the manner in which the accelerating means has been operated, and
prohibit the throttle opening rate limitation if the target throttle-open amount is below
a prescribed throttle-open amount or if the target throttle opening rate is below a
prescribed opening rate.
6. A throttle system as set forth in any one of claims 1 to 5, characterized in that:
the throttle controlling means is further adapted to:
determine whether the opening amount of the throttle valve is changing across a
predetermined range thereof, and
prohibit the throttle opening rate limitation if the opening amount is not changing
across the predetermined range.
7. A throttle system for an internal combustion engine, comprising a throttle valve,
accelerating means operated by an operator to adjust an engine output of the internal
combustion engine, throttle valve controlling means for controlling the throttle valve to
accordance with the manner in which the accelerating means has been operated,
the throttle valve controlling means being adapted to execute under given conditions a

throttle opening rate limitation limiting a throttle opening rate at which the throttle valve is opened, below a limit opening rate, the throttle system being characterized in that:

the throttle valve controller is further adapted to:

determine whether the throttle opening amount is changing across a predetermined range thereof, and

prohibit the throttle opening rate limitation if the throttle opening amount is not changing across the predetermined range.

8. A method for controlling a throttle valve of an internal combustion engine, comprising:

executing under given conditions a throttle opening rate limitation limiting a throttle opening rate at which the throttle valve is opened, below a limit opening rate; and

prohibiting the throttle opening rate limitation if an engine speed of the internal combustion engine detected at starting opening the throttle valve is above a prescribed engine speed.

9. A method as set forth in claim 8, further comprising:

prohibiting the throttle opening rate limitation if an engine torque of the internal combustion engine detected at starting opening the throttle valve is above a prescribed engine torque.

10. A method as set forth in claim 8, further comprising:

prohibiting the throttle opening rate limitation if an opening amount of the throttle valve detected at starting opening the throttle valve is above a prescribed opening amount.

11. A method as set forth in any one of claims 8 to 10, further comprising:

prohibiting the throttle opening rate limitation if the throttle valve is not required to open quickly.

12. A method as set forth in any one of claims 8 to 10, further comprising:
determining a target throttle-open amount by which the throttle valve is required to open and a target throttle opening rate at which the throttle valve is required to open; and
prohibiting the throttle opening rate limitation if the target throttle-open amount is below a prescribed throttle-open amount or if the target throttle opening rate is below a prescribed opening rate.
13. A method as set forth in any one of claims 8 to 12, further comprising:
prohibiting the throttle opening rate limitation if an opening amount of the throttle valve is not changing across a predetermined range thereof.
14. A method for controlling a throttle valve of an internal combustion engine, comprising:
executing under given conditions a throttle opening rate limitation limiting a throttle opening rate at which the throttle valve is opened, below a limit opening rate, and
prohibiting the throttle opening rate limitation if an opening amount of the throttle valve is not changing across a predetermined range thereof.
15. A throttle system for an internal combustion engine, comprising:
a throttle valve;
an accelerator operated by an operator to adjust an engine output of the internal combustion engine;
an engine speed detector for detecting an engine speed of the internal combustion engine; and
a throttle valve controller that is adapted to:
control the throttle valve to open in accordance with a manner in which the accelerator has been operated,
execute under given conditions a throttle opening rate limitation limiting a throttle

opening rate at which the throttle valve is opened, below a limit opening rate, and

prohibit the throttle opening rate limitation if the engine speed detected via the engine speed detector at starting opening the throttle valve is above a prescribed engine speed.

16. A throttle system as set forth in claim 15, further comprising an engine torque detector for detecting an engine torque of the internal combustion engine, wherein

the throttle valve controller is further adapted to prohibit the throttle opening rate limitation if the engine torque detected via the engine torque detector at starting opening the throttle valve is above a prescribed engine torque.

17. A throttle system as set forth in claim 15, further comprising a throttle opening amount detector for detecting an opening amount of the throttle valve, wherein

the throttle valve controller is further adapted to prohibit the throttle opening rate limitation if the opening amount of the throttle valve detected via the throttle opening amount detector at starting opening the throttle valve is above a prescribed opening amount.

18. A throttle system as set forth in claim 15, wherein

the throttle valve controller is further adapted to:

determine based on the manner in which the accelerator has been operated whether the throttle valve is required to open quickly, and

prohibit the throttle opening rate limitation if the throttle valve is not required to open quickly.

19. A throttle system as set forth in claim 15, wherein the throttle controller is further adapted to:

determine a target throttle-open amount by which the throttle valve is required to open and a target throttle opening rate at which the throttle valve is required to open based on the manner in which the accelerator has been operated, and

prohibit the throttle opening rate limitation if the target throttle-open amount is below a prescribed throttle-open amount or if the target throttle opening rate is below a prescribed opening rate.

20. A throttle system as set forth in claim 15, wherein the throttle controller is further adapted to:

determine whether the opening amount of the throttle valve is changing across a predetermined range thereof, and

prohibit the throttle opening rate limitation if the opening amount is not changing across the predetermined range.

21. A throttle system for an internal combustion engine, comprising:

an accelerator operated by an operator to adjust an engine output of the internal combustion engine;

a throttle valve; and

a throttle valve controller that is adapted to:

control the throttle valve to open in accordance with the manner in which the accelerator has been operated,

execute under given conditions a throttle opening rate limitation limiting a throttle opening rate at which the throttle valve is opened, below a limit opening rate;

determine whether the throttle opening amount is changing across a predetermined range thereof, and

prohibit the throttle opening rate limitation if the throttle opening amount is not changing across the predetermined range.